## REMARKS

### Summary of the Office action

Claims 1-2, 4-7, 9-17, 19-24 and 26-108 are pending in the present application.

All claims have been rejected as either anticipated by or rendered obvious over Espiau et al., U.S. patent No. 6,737,809 ("the Espiau patent"), which corresponds to U.S. patent application Serial No. 09/809,718 ("the Espiau application"). In addition, certain claims have been rejected as failing to comply with the written requirement and/or for lack of indefiniteness.

### Applicants' Response

Applicants have cancelled claims 1-108 without prejudice and have added new claims 109-131. New claims 109-131 are substantially copied from claims 1, 2, 4-7, 9-16, 18-21, 25, 27 and 32-34 of the U.S. Patent No. 6,737,809 ("the Espiau patent"). The application from which the Espiau patent matured was filed on March 15, 2001, and claims priority to U.S. provisional patent application Serial No. 60/222,028, filed on July 31, 2000.

As set forth in the accompanying declarations of Gregory A. Prior and Edmund Sandberg, applicants are the true and correct inventors of the invention described and claimed in the Espiau patent. Moreover, as will be apparent from the accompanying declarations, the alleged inventors of the Espiau patent learned of the present invention directly from the inventors of the present application. Because the invention set forth in the newly added claims is for the same invention as claimed in the Espiau patent, applicants renew, pursuant to 37 C.F.R. §41.202, their Request for Interference with that

patent. Accordingly, applicants respectfully request an interference with the Espiau patent be declared.

Because the Espiau patent and its application are not prior art to the present invention, applicants respectfully submit that all of the art-based rejections set forth in the Office action should be withdrawn, and that an interference should be declared instead.

Request Under 37 C.F.R. § 41.202
For Interference With Patent

Pursuant to 37 C.F.R. § 41.202, applicants hereby request that an interference be declared between the present application and the Espiau patent. The present application was filed March 26, 2001, and claims the benefit of priority of the following U.S. provisional patent applications:

Serial No. 60/192,731, filed March 27, 2000;
Serial No. 60/224,059, filed August 9, 2000;
Serial No. 60/224,298, filed August 10, 2000;
Serial No. 60/224,290, filed August 10, 2000;
Serial No. 60/224,291, filed August 10, 2000;
Serial No. 60/224,257, filed August 10, 2000;
Serial No. 60/224,289, filed August 10, 2000;
Serial No. 60/224,866, filed August 11, 2000; and
Serial No. 60/234,415, filed September 21, 2000.

I. Identification of Patent For Interference
(37 C.F.R. § 41.202 (a)(1))

Applicants identify U.S. Patent No. 6,737,809, which corresponds to U.S. patent application Serial No. 09/809,718, for this interference.

## II. Presentation of Proposed Counts and Identification of Interfering Claims (37 C.F.R. § 41.202(a)(2))

Applicants respectfully present the following proposed counts:

Count 1

A lamp comprising:

(a) a waveguide having a body comprising a ceramic dielectric material of a preselected shape and preselected dimensions, the body having a first side determined by a first waveguide outer surface;

(b) a first feed positioned within and in intimate contact with the waveguide body, adapted to couple energy into the body from a source having an output and operating at a preselected frequency and intensity, the feed connected to the source output, said frequency and intensity and said body shape and dimensions selected such that the body resonates in at least one resonant mode having at least one electric field maximum;

(c) an enclosed first cavity depending from said first surface into the waveguide body; and

(d) a first bulb positioned in the cavity at a location corresponding to an electric field maximum during operation, the bulb containing a gas-fill which when receiving energy from the resonating waveguide body forms a light-emitting plasma.

Count 2

A method for producing light comprising the steps of:

(a) coupling energy characterized by a frequency and intensity into a waveguide having a body comprising a ceramic

dielectric material of a preselected shape and preselected dimensions, the body having a side determined by an outer waveguide surface and a cavity depending from said surface into the body, said frequency and intensity and said body shape and dimensions selected such that the body resonates in at least one resonant mode having at least one electric field maximum;

(b) directing resonant energy into an envelope determined by the cavity and a window, the envelope containing a gas-fill; and

(c) creating a plasma by interacting the resonant energy with the gas-fill, thereby causing emission of light.

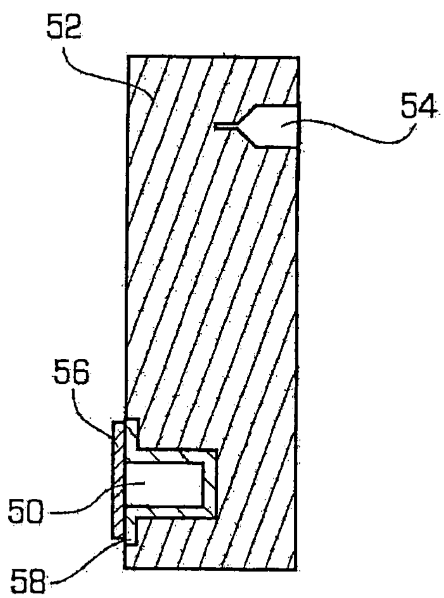
Applicants submit that independent claim 109 and dependent claims 110-128 correspond to proposed count 1, and independent claim 129 and dependent claims 130 and 131 correspond to proposed count 2. The identified claims correspond to their respective counts because claim 109 is identical to proposed count 1 and claim 129 is identical to proposed count 2.

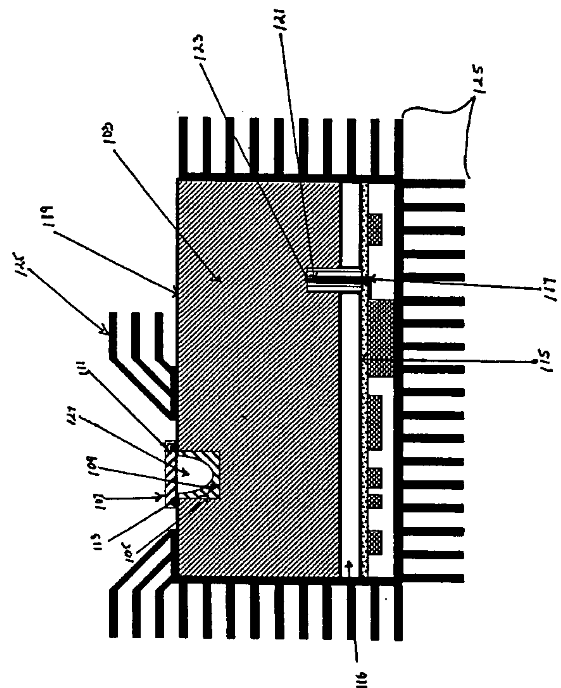
## III. Claims Interfere Within the Meaning of §41.203(e) (37 C.F.R. § 41.202 (a)(3))

Newly added claims 109-131 of this application are substantially copied from claims 1, 2, 4-7, 9-16, 18-21, 25, 27 and 32-34 of the Espiau patent. As illustrated in the claim chart appended hereto as appendix A pursuant to 37 C.F.R. 41.202(a)(5), new claims 109-131 are fully supported by the disclosure of the present application.

Applicants' specification discloses with respect to FIGS. 3-5 a ceramic waveguide having a substantially elongated

prismatic configuration. The waveguide accepts a high frequency source of energy (54, 64, 74) at one end and has a gas-filled cavity (50, 60, 70) at the other. This precise structure is disclosed and claimed in the Espiau application. Compare, FIG. 3 of the present application (on the left) to FIG. 1 of the Espiau patent (on the right), reproduced below:



As described in the accompanying declarations of Messrs. Prior and Sandberg, it is not coincidental that the invention disclosed in the present application and that of the Espiau patent is identical. The alleged inventors of the Espiau patent learned of the present invention from the inventors of the present application.

Applicants' claims 109-131 are fully supported in the specification, were invented by applicants prior to the involvement of the alleged inventors identified on the Espiau patent, and are patentable to applicants. Accordingly, applicants respectfully submit that an interference must be declared.

## IV. Applicants Will Prevail On Priority (37 C.F.R. § 41.202 (a)(4))

Applicants will prevail on priority because they, and not the alleged inventors of the Espiau patent, are the first and only inventors of the subject matter of the proposed counts. This interference is requested based on applicants' belief that the alleged inventors of the Espiau patent first acquired knowledge of the subject matter of the proposed counts from the applicants. Specifically, in late 1999 and 2000, the former assignee of the present application, Digital Reflections, Inc. ("DRI"), retained Turner Engineering Co. ("TENCO") to provide assistance in designing certain of the electronic components to be used with the waveguide lamp of the present invention. The alleged inventors of the Espiau application - Mr. Espiau, Mr. Joshi and Mr. Chang - were employees or consultants of TENCO at that time. In connection with the work to be performed by TENCO for DRI, applicants herein provided their pre-existing details of the waveguide lamp of the present invention to TENCO, including the alleged inventors of the Espiau patent.

Applicants have set forth in the accompanying declarations of Gregory A. Prior and Edmund Sandberg and attached exhibits the support for their claim that they invented the subject matter of the proposed counts prior to the alleged inventors of the Espiau patent.

## V. Claim Chart of Applicants' Claims and Specification (37 C.F.R. § 41.202 (a)(5))

Applicants append hereto Appendix A, a chart showing where the written description of the specification of the present application provides support for new claims 109-131.

V. Constructive Reduction To Practice
(37 C.F.R. § 41.202 (a)(6))

Applicants submit that the actual reduction to practice of the claimed invention was accomplished prior to the filing date of the Espiau patent, as set forth in the accompanying declarations.

Applicants further submit that constructive reduction to practice occurred upon filing of the specification of the present application as set forth in Appendix A and in conjunction with the provisional applications for which the benefit of priority is claimed herein.

VII. Conclusion

An early and favorable action declaring an interference between the present application and the Espiau patent is respectfully requested.

Respectfully submitted,

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<u>**Appendix A**</u>

| **Count 1** | |
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| **Applicant's Claim** | **Support in Applicant's Specification** |
| 109. A lamp comprising: | Applicants' specification discloses different embodiments of a plasma lamp comprising a waveguide. *See, e.g.*, FIGS. 3-5 and ¶¶ [0032] to [0038]. |
| (a) a waveguide having a body comprising a ceramic dielectric material of a preselected shape and preselected dimensions, the body having a first side determined by a first waveguide outer surface; | Waveguide (52, 62, 72) has a body comprising a ceramic material of a preselected shape and preselected dimensions. *See* FIG. 3 (rectangular), FIG. 4 (cylindrical), FIG. 5 (varying cross-section), ¶¶ [0032-0038], original claims 1, 6 and 15. A specific example of a rectangular waveguide is set forth in ¶ [0041]: a rectangular waveguide having dimensions of 34.72 mm by 38.84 mm by 17.37 mm. As illustrated in FIGS. 3-5, each body has a first side that is determined by the first waveguide outer surface. |

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| (b) a first feed positioned within and in intimate contact with the waveguide body, adapted to couple energy into the body from a source having an output and operating within at a preselected frequency and intensity, the feed connected to the source output, said frequency and intensity and said body shape and dimensions selected such that the body resonates in at least one resonant mode having at least one electric field maximum; | The specification describes a first feed, *e.g.*, a source (54, 64, 74) such as an antenna or probe, positioned within and in intimate contact with waveguide body (52, 62, 72). *See* FIGS. 3-5, ¶¶ [0032] to [0039]. The feed (54, 64, 74) is adapted to couple energy into the body from a high frequency source having an output. The source operates at a preselected frequency within the range of conventional radio and microwave frequencies, *see* [0005], e.g., which encompass the frequency range of 0.5 to 30 GHz. A specific example is provided in ¶ [0041], which describes that the antenna is connected to and driven by a source at a frequency of 2.4 GHz. As described in ¶ [0033], the waveguide forms a resonant structure having a resonant mode at the frequency of the energy from the high frequency source having at least one electric field maximum. *See* ¶¶ [0032] to [0039] and original claims 2, 7 and 17. |
| (c) an enclosed first cavity depending from said first surface into the waveguide body; and | The specification discloses a gas housing (50, 60, 70) in the form of an enclosed first cavity depending from the first surface into the waveguide body (52, 62, 72). *See* FIGS. 3-5 and ¶¶ [0032] to [0039]. The cavity may include a ceramic liner, such as alumina, to improve sealing of the gas fill. *See* liner 58 of FIG. 3, ¶ [0035]. |

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| (d) a first bulb positioned in the cavity at a location corresponding to an electric field maximum during operation, the bulb containing a gas-fill which when receiving energy from the resonating waveguide body forms a light-emitting plasma. | The specification discloses that the "bulb" of the lamp may comprise either the gas-filled cavity (50, 60, 70) (*see, e.g.*, ¶ [0032]) with or without a liner (58, FIG. 3) or a separate structure disposed within the cavity (*see* ¶ [0040], which describes a gas-filled quartz structure disposed in the waveguide cavity). In all cases, this "bulb" is positioned at a location corresponding to an electric field maximum during operation, so that when the gas fill receives energy from the resonating waveguide body (52, 62, 72) it forms a light-emitting plasma. *See* FIGS. 3-5 and ¶¶ [0002], [0005], [0028], [0033], [0037] and [0040]. |
| 110. The lamp of claim 109, wherein the waveguide has an outer coating of a metallic material. | This feature is described in conjunction with application of known principles of waveguide design; *see* paragraph [0033], which provides the equations for computing the frequencies for the resonant modes for a rectangular waveguide having metal boundaries. |
| 111. The lamp of claim 109, wherein the bulb comprises an outer wall having an inner surface, and a window covering the cavity. | With respect to the embodiments of FIGS. 3-5, the specification describes a gas housing or cavity that contains the gas fill and defines both an outer wall and inner surface of the "bulb". *See* ¶¶ [0032] to [0039]. The gas housing may further comprise ceramic liner 58. *See* ¶ [0035]. In an alternative embodiment, the cavity may include a separate gas-filled quartz structure disposed within the cavity. *See* [0040]. In all cases, the bulb comprises a window (56, 66, 76) covering the cavity (50, 60, 70). *See, e.g.*, FIGS. 3-5 and ¶ [0032] to [0039] and original claim 15. |

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| 112. The lamp of claim 111, wherein the window is substantially transparent to the light emitted by the plasma. | Window (56, 66, 76) is substantially transparent to the light emitted by the plasma. *See, e.g.,* ¶¶ [0010] and [0032] and original claim 15. |
| 113. The lamp of claim 111, wherein the window comprises sapphire. | The specification discloses that the window is preferably made from sapphire. *See* ¶ [0032] and [0036] and original claim 16. |
| 114. The lamp of claim 111, wherein the inner surface of the bulb outer wall is at least partially reflective of light emitted by the plasma. | The specification describes that a layer of material, such as MgO, may be disposed on the interior surface of the cavity to add to the brightness of the plasma lamp. *See* ¶ [0039]. The specification also describes that a reflective coating may be used to increase the brightness of the lamp. *See* ¶ [0043]. |
| 115. The lamp of claim 111, wherein the bulb outer wall comprises a dielectric material. | The outer wall of the gas housing comprises ceramic, which is a dielectric material. *See*, e.g., ¶¶ [0032] to [0039] and original claims 1, 4-6, 9 and 15. |
| 116. The lamp of claim 115, wherein the dielectric material is a ceramic. | The outer wall of the gas housing comprises ceramic, which is a dielectric material, *see*, e.g., ¶¶ [0032] to [0039] and original claims 4, 9 and 15. |
| 117. The lamp of claim 111, wherein the bulb outer wall and window have approximately equal coefficients of thermal expansion. | The specification describes that the ceramic used for the waveguide may comprise alumina ($Al_2O_3$). *See, e.g.,* ¶ [0041] and original claims 5, 11 and 20. The specification also describes that the preferred material for light transmissive window 56 is sapphire, which is single crystal $Al_2O_3$. *See*, ¶¶ [0032] and [0036] and original claim 16. Alumina and sapphire are known to have approximately equal coefficients of thermal expansion. *Compare*, Espiau Patent at, *e.g.*, Col. 6, lines 46-51. |

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| 118. The lamp of claim 111, wherein the bulb outer wall thermally isolates the bulb from the waveguide body. | The specification describes the use of liner 58 within the gas housing, and in an alternative embodiment, use of a separate quartz structure within the gas housing. *See* ¶¶ [0035] and [0040]. Both structures will thermally isolate the bulb from the waveguide body. |
| 119. The lamp of claim 109, wherein said ceramic dielectric material has a dielectric constant greater than about 2. | The specification describes that the waveguide comprises a ceramic such as alumina, titanium dioxide or barium neodymium titinate, all of which have dielectric constants greater than 2. *See* ¶¶ [0041] and [0035] and original claims 5, 11-13 and 20-22. |
| 120. The lamp of claim 109, wherein said operating frequency is in a range from about 0.5 to about 10 GHz. | Feed 54 operates within the range of conventional radio and microwave frequencies, *see* [0005], which encompass the frequency range of 0.5 to about 30 GHz. A specific example of a feed driven at 2.4 GHz is described in paragraph [0041]. |
| 121. The lamp of claim 109, wherein said shape of the waveguide body is a rectangular prism. | FIG. 3 illustrates that the shape of waveguide 52 body may be a rectangular prism. *See also* ¶¶ [0032] and [0033]. |
| 122. The lamp of claim 109, wherein the first feed is in intimate contact with the waveguide body. | This feature is inherent in the description of the waveguide set forth in ¶¶ [0032] to [0039], as there must be intimate contact of the first feed with the waveguide body to transfer the energy required to cause the waveguide to resonate. *See also* ¶ [0033]. |
| 123. The lamp of claim 109, wherein the gas-fill comprises a noble gas and a metal halide. | The gas-fill comprises a noble gas, *e.g.*, xenon, neon or argon, and a metal halide, *e.g.*, indium bromide. *See* ¶ [0029]. |

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| 124. The lamp of claim 109 wherein the source is intrinsic to the lamp. | As disclosed with respect to FIGS. 3-5, the specification describes that the source is integral to the lamp. *See* ¶ [0032] to [0039] and original claims 3, 8 and 18. |
| 125. The lamp of claim 109, wherein the first feed is inserted into the waveguide body through a second waveguide outer surface generally opposed to said first waveguide outer surface. | Feed 54 is inserted into waveguide body 52 through a surface opposite to that in which gas housing 50 is formed. *See* FIG. 3. See also, FIGS. 4-5. |
| 126. The lamp of claim 109, wherein said shape of the waveguide body is a cylindrical prism. | In FIGS. 4A and 4B, described at ¶ [0036], waveguide body 62 is a cylindrical prism. |
| 127. The lamp of claim 109, wherein the first feed is positioned proximate to an electric field maximum. | The specification discloses that the locations of the source and the gas housing are chosen so radiation in the waveguide exhibits a maximum in intensity at or near to the location of the housing in order to optimize energy coupling to the gas. *See* ¶¶ [0033] and [0038]. Such optimization of energy transfer requires that the feed be positioned proximate to an electric field maximum. |

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| 128. The lamp of claim 109, wherein the waveguide body resonates in a mode having at least two electric field maxima, and the first feed and bulb are positioned proximate to different electric field maxima. | The specification discloses that the locations of the source and the gas housing are chosen so radiation in the waveguide exhibits a maximum in intensity at or near to the location of the housing in order to optimize energy coupling to the gas. *See* ¶ [0033]. The specification further discloses that the waveguide operates in a resonant mode at the frequency of radiation from the source: "The dimensions of the waveguide and the locations of the source and the housing may appropriately be chosen to produce a resonant mode that maximizes energy from the source to the gas housing at the operating frequency band of the source." *See* ¶¶ [0033] and [0038]. Such maximization of energy transfer requires that the source and gas housing be positioned at different electric field maxima. |

| Count 2 | |
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| **Applicant's Claim** | **Support in Applicant's Specification** |
| 129. A method for producing light comprising the steps of: | The specification discloses a method for producing light comprising a series of steps of energizing a waveguide with an integral gas-filled cavity. |
| (a) coupling energy characterized by a frequency and intensity into a waveguide having a body comprising a ceramic dielectric material of a preselected shape and preselected dimensions, the body having a side determined by an outer waveguide surface and a cavity depending from said surface into the body, said frequency and intensity and said body shape and dimensions selected such that the body resonates in at least one resonant mode having at least one electric field maximum; | The specification describes with respect to FIGS. 3-5 steps of coupling energy at a predetermined frequency into a waveguide having a body comprising a ceramic dielectric material of a preselected shape, *e.g.*, rectangular, and preselected dimensions. *See*, ¶¶ [0032] to [0044]. In each of FIGS. 3-5, the body (52, 62, 72) has a side determined by an outer waveguide surface and a cavity (50, 60, 70) depending from the surface into the body. The specification further describes that energy applied to the body is of selected frequency and intensity, and that the body is of selected shape and dimensions, such that the body resonates in at least one resonant mode having at least one electric field maximum. *See* ¶ [0032] to [0039]. |
| (b) directing resonant energy into an envelope determined by the cavity and a window, the envelope containing a gas-fill; and | The specification further describes directing resonant energy into an envelope determined by the cavity 50 and a window 56, the envelope containing a gas-fill. *See* FIG. 3 and ¶¶ [0032] to [0038]. |
| (c) creating a plasma by interacting the resonant energy with the gas-fill, thereby causing emission of light. | The specification describes creating a plasma by interacting the resonant energy with the gas-fill, thereby causing emission of light. *See, e.g.*, ¶¶ [0028] and [0032] to [0038]. |

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| 130. The method of claim 129 further comprising the step of directing the light emitted through the window. | The specification discloses that the discharge created by the plasma is emitted through a light transmissive window (56, 66, 76) that covers the gas-filled cavity, and that the brightness of the emitted energy may be improved by using suitable coatings within the cavity. *See* ¶ [0032] to [0038], [0039] and [0044]. |
| 131. The method of claim 129, further comprising the step of dissipating heat generated by the plasma through said waveguide outer surface. | The specification describes that heat generated within the plasma will be dissipated through the ceramic waveguide, and that if a quartz structure is disposed in within the cavity, the ceramic encasing the quartz will act as a heat sink. *See, e.g.*, ¶ [0042]. |